1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Applicant is respectfully requested to provide a location within the disclosure to support any further amendments to the claims due to when filing an amendment an applicant should show support in the original disclosure for new or amended claims. See MPEP § 714.02 and § 2163.06 ("Applicant should specifically point out the support for any amendments made to the disclosure.").

Response to Amendment/Arguments

3. Examiner accepts amendments to the Specification and the Declaration and respectfully withdraws the objections, accordingly.

4. Applicant's arguments with respect to claims 6 and 7 have been considered but are moot in view of the new ground(s) of rejection.

5. Applicant's arguments filed 10 July 2008 have been fully considered but they are not persuasive as set forth below.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 6 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 6 recites the limitation "the body in line 6; "the base" in line 6; and "the thermal welding" in lines 15-16. There is insufficient antecedent basis for these limitations in the claim.

9. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: "A heater chip for thermocompression bonding comprising: a heater chip for thermocompression bonding...". It is unclear and uncertain to the examiner the relation of the two heater chips". In addition, it is unclear to how the "projection portion" is "for thermo-welding" and "for connection of the thermocouple" since it is opposite the thermocompression bonding portion. Further clarification is required. The claims were examined as the second heater chip being the body of the first heater chip.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (U.S. Patent No. 5,297,716) in view of Tanaka (U.S. Patent No. 5,048,180).

Smith et al. disclose a heater chip for thermocompression bonding (see Figures 4, 9) comprising: a heater chip (soldering tip; see Figures 4, 9) for thermocompression bonding wherein a small projection-like thermocompression bonding portion (central region 100) heated up by conduction resistance is provided on a head end of a small plate-like body (see Figures 4, 9), which is made of molybdenum, the head end having a reduced width with respect to the small plate-like body (see Figures 4, 9), a cut (region between legs 80 and 82; see Figures 4, 9) provided in the body, from the base end side (top of Figures 4, 9) toward a vicinity of the thermocompression bonding portion (central region 100; bottom of Figures 4, 9), both sides of the cut serving as a conduction terminal portion (column 4, lines 39-43; see Figures 4, 5, 9), a thermocouple for a temperature detecting portion (wires 20, 22 or 26, 28 or 120,122) are attached together to form a thermocouple arrangement; column 2, line 55 – column 6, line 21) installed in the vicinity of the thermocompression bonding portion (see Figures 4, 5, 9, 10), a dilated trapezoidal cut (lower half of cut region between legs 80 and 82) provided at one end of the cut (see Figures 4, 9), a projection portion (protrusion 102) for thermo-welding provided opposite to the thermocompression bonding portion (central region 100; bottom of Figures 4, 9), the temperature-detecting portion (wires 20, 22 or 26, 28

or 120,122) comprising each end of two conducting wires thermally welded (fuse being equivalent to thermally welded; column 2, lines 22-25; column 6, lines 15-22) to the projection portion (protrusion 102) to create the thermocouple, the thermal welding being characterized fuses with the projection portion (protrusion 102).

Smith et al. disclose all of the limitations of the claimed invention, as previously set forth, except for the body being is made of tungsten series alloy in stead of molybdenum; the length of the projection portion being 0.4 millimeters or more; and the thermal welding being characterized in that a wet melting portion spreads and covers up top and bottom ridges of a head area of the projection portion.

However, Tanaka shows that a tungsten is an equivalent structure known in the art (Abstract).

Similarly, Smith et al. teach that both joint ends of a pair of conducting wires (wires 20, 22 or 26, 28 or 120,122) are thermally fused (column 4, lines 46-62; column 5, lines 2-12; column 6, lines 15-22) with explicitly reference to wires (26, 28) being melted and fused together (170) either within opening (104) or adjacent to it (column 6, lines 15-22). It is also known in the art the amount of a thermally fused material in a connection as well as the degree of wet-spreading of the thermally fused material in the connection is base on experimentation and desired characteristics of the weld/apparatus.

Therefore, since Tanaka teaches that molybdenum and tungsten materials for heat conducting members are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute tungsten

for molybdenum. Similarly, to provide the wet-spreading periphery of the temperature-detecting portion covering each ridge of an apical surface of the projection portion for welding would have been a mere engineering expediency as Smith et al. clearly teaches the use of melting two wires together to provide a thermocouple and a bond to central region and it is known in the art the degree of wet-spreading is based on the desired characteristic of the weld/apparatus. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to make the length of the projection portion preferably 0.4 millimeters or more, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

In addition, Smith et al. teach that the projection portion (protrusion 102) comprises thermocouple wires (20, 22 or 26, 28 or 120,122) being thermally fused but is silent as to the method of fusing. The claimed phrase "the temperature-detecting portion comprising each end of two conducting wires *thermally welded* to the projection portion to create the thermocouple, the *thermal welding* being characterized in that a wet melting portion spreads and covers up top and bottom ridges of a head area of the projection portion" is being treated as a product by process limitation; that is, that the projection portion is thermally welded to the thermocouple wires. As set forth in MPEP 2113, product by process claims are NOT limited to the manipulations of the recited steps, only to the structure implied by the steps. Once a product appearing to be substantially the same or similar is found, a 35 U.S.C. 102/103 rejection may be made

and the burden is shifted to applicant to show an unobvious difference. See MPEP 2113.

Thus, even though Smith et al. is silent as to the process used to fuse the projection portion to the thermocouple wires, it appears that the product in Smith et al. would be the same or similar as that claimed; especially since both applicant's product and the prior art product is made by thermally fusing the projection portion to the thermocouple wires (column 2, lines 21-25; column 6, lines 15-22, see Figure 10).

13. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (U.S. Patent No. 5,297,716) in view of Tanaka (U.S. Patent No. 5,048,180) as applied to claim 6 above, and further in view of Erlach (U.S. Patent No. 5,109,147).

Smith et al. in view of Tanaka discloses all of the claimed limitations, as previously set forth, except for a small cut being provided nearly at the midpoint of the cut in a longitudinal direction so that the two conducting wires of the thermocouple can be inserted and supported with a protection tube.

However, a small cut being provided nearly at the midpoint of a cut in a longitudinal direction so that the two conducting wires of the thermocouple can be inserted and supported with a protection tube is known in the art. Erlach, for example, teaches a small cut (inherent cut for attachment of strain relief 54) being provided nearly at the midpoint of the cut (heater bar 40 with cut for longitudinal shim 44) in a longitudinal direction so that the two conducting wires (52) of the thermocouple (48) can be inserted and supported with a protection tube (strain relief body 54). Erlach further

teaches the advantage of such a configuration provides a means to prevent any strain on the thermocouple wires from being applied at the fragile point where the bare wires are attached to the thermocouple, thereby increasing the operational longevity of the apparatus (column 6, lines 35-42; see Figures 2, 4). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the thermocouple wire/ heater chip body configuration of Smith et al. in view of Tanaka with the small cut along the heater body cut of Erlach in order to provide a means to prevent any strain on the thermocouple wires from being applied at the fragile point where the bare wires are attached to the thermocouple, thereby increasing the operational longevity of the apparatus.

Remarks

14. With respect to applicants' reply/argument that Smith et al. does not teach or suggest all the features of the claim the examiner respectfully disagrees and directs applicant to the rejection of claim 6 above.

15. With respect to applicants' reply/argument that Smith et al. does not teach or suggest the conducting wires being welded to the projection portion, with the wet melting portion covering the top and bottom ridges of the head area of the projection portion, the examiner respectfully disagrees. Smith et al. explicitly teach the wires (26, 28) being melted (to melt requires heat) as well as the end of the wires being fused together (column 2, lines 21-25; column 6, lines 15-22). Smith et al. further teach the wires that are melted (via heat) may fuse to the central region (100) during the process.

A "weld" is a metal joint formed by softening *with heat and fusing*. "Welding" would be the act of heating to create such a structure or weld. Clearly, the act of thermally fusing the metal wires and metal heater chip would be equivalent to "the thermally welding". Furthermore, the degree of "the wet melting portion" covering the various portions of the projection portion would be dependent on temperature and duration of the fusing/welding process and is clearly design/engineering specific depending on desired result/outcome. Therefore since Smith et al. clearly teach fusing of metal components (wires and heater chip) by heat with fusing with heat being equivalent to "thermally welded" and the spread of "the wet melting portion" being design/engineering specific, Smith et al. fully meets "the temperature-detecting portion comprising each end of two conducting wires thermally welded to the projection portion to create the thermocouple, the thermal welding being characterized in that a wet melting portion spreads and covers up top and bottom ridges of a head area of the projection portion" given its broadest reasonable interpretation.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN J. RALIS whose telephone number is (571)272-6227. The examiner can normally be reached on Monday - Friday, 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on 571-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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SJR
October 22, 2008